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PTO/SB/05 (03-01)  
Approved for use through 10/31/2002. OMB 0651-0032

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# UTILITY PATENT APPLICATION TRANSMITTAL

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Attorney Docket No.

First Inventor

SCOTT MUIRHEAD

Title

TRIPLE SHEET THERMOFORMING  
APPARATUS

Express Mail Label No.

## APPLICATION ELEMENTS

See MPEP chapter 600 concerning utility patent application contents.

1. ☐ Fee Transmittal Form (e.g., PTO/SB/17)  
(Submit an original and a duplicate for fee processing)
2. ☒ Applicant claims small entity status.  
See 37 CFR 1.27.
3. ☒ Specification [Total Pages 34]  
(preferred arrangement set forth below)
  - Descriptive title of the invention
  - Cross Reference to Related Applications
  - Statement Regarding Fed sponsored R & D
  - Reference to sequence listing, a table, or a computer program listing appendix
  - Background of the Invention
  - Brief Summary of the Invention
  - Brief Description of the Drawings (if filed)
  - Detailed Description
  - Claim(s)
  - Abstract of the Disclosure
4. ☒ Drawing(s) (35 U.S.C. 113) [Total Sheets 15]
5. Oath or Declaration [Total Pages 1]
  - a. ☒ Newly executed (original or copy)
  - b. ☐ Copy from a prior application (37 CFR 1.63 (d))  
(for continuation/divisional with Box 18 completed)
  - c. ☐ **DELETION OF INVENTOR(S)**  
Signed statement attached deleting inventor(s) named in the prior application, see 37 CFR 1.63(d)(2) and 1.33(b)
6. ☐ Application Data Sheet. See 37 CFR 1.76

ADDRESS TO:

Assistant Commissioner for Patents  
Box Patent Application  
Washington, DC 20231

7. ☐ CD-ROM or CD-R in duplicate, large table or Computer Program (Appendix)
8. Nucleotide and/or Amino Acid Sequence Submission (if applicable, all necessary)
  - a. ☐ Computer Readable Form (CRF)
  - b. Specification Sequence Listing on:
    - i. ☐ CD-ROM or CD-R (2 copies); or
    - ii. ☐ paper
  - c. ☐ Statements verifying identity of above copies

## ACCOMPANYING APPLICATION PARTS

9. ☐ Assignment Papers (cover sheet & document(s))
10. ☐ 37 CFR 3.73(b) Statement ☒ Power of Attorney  
(when there is an assignee)
11. ☐ English Translation Document (if applicable)
12. ☐ Information Disclosure Statement (IDS)/PTO-1449 ☐ Copies of IDS Citations
13. ☐ Preliminary Amendment
14. ☒ Return Receipt Postcard (MPEP 503)  
(Should be specifically itemized)
15. ☐ Certified Copy of Priority Document(s)  
(if foreign priority is claimed)
16. ☐ Nonpublication Request under 35 U.S.C. 122 (b)(2)(B)(i). Applicant must attach form PTO/SB/35 or its equivalent.
17. ☐ Other: .....

18. If a CONTINUING APPLICATION, check appropriate box, and supply the requisite information below and in a preliminary amendment, or in an Application Data Sheet under 37 CFR 1.76:

☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP)

Prior application information:

Examiner L. Tentoni

of prior application No. 089/ 377 792

Group Art Unit 1732

For CONTINUATION OR DIVISIONAL APPS only: The entire disclosure of the prior application, from which an oath or declaration is supplied under Box 5b, is considered a part of the disclosure of the accompanying continuation or divisional application and is hereby incorporated by reference. The incorporation can only be relied upon when a portion has been inadvertently omitted from the submitted application parts.

## 19. CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label

(Insert Customer No. or Attach bar code label here)

or ☒ Correspondence address below

Name

SCOTT MUIRHEAD

RR 3 BOX 712X

Address

City

UNIONTOWN

State

PA

Zip Code

15401

Country

U.S.A.

Telephone

724 4370250

Fax

4370250

Name (Print/Type)

SCOTT MUIRHEAD

Registration No. (Attorney/Agent)

Signature

*Scott Muirhead*

Date

07/02/2001

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### Certificate of Mailing under 37 CFR 1.8

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to:

**Assistant Commissioner for Patents  
Washington, D.C. 20231**

on JULY 2 2001  
Date



Signature

SCOTT MUIRHEAD

Typed or printed name of person of signing Certificate

Note: Each paper must have its own certificate of mailing, or this certificate must identify each submitted paper.

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# FEE TRANSMITTAL for FY 2001

Patent fees are subject to annual revision.

## Complete if Known

Application Number	
Filing Date	
First Named Inventor	SCOTT MUIRHEAD
Examiner Name	
Group Art Unit	
Attorney Docket No.	

TOTAL AMOUNT OF PAYMENT (\$)

## METHOD OF PAYMENT

1. ☐ The Commissioner is hereby authorized to charge indicated fees and credit any overpayments to:

Deposit Account Number

Deposit Account Name

☐ Charge Any Additional Fee Required Under 37 CFR 1.16 and 1.17

☒ Applicant claims small entity status. See 37 CFR 1.27

2. ☐ Payment Enclosed:

☐ Check ☐ Credit card ☐ Money Order ☐ Other

## FEE CALCULATION

1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
101 710	201 355	Utility filing fee	355
106 320	206 160	Design filing fee	
107 490	207 245	Plant filing fee	
108 710	208 355	Reissue filing fee	
114 150	214 75	Provisional filing fee	

SUBTOTAL (1) (\$) 355

2. EXTRA CLAIM FEES

Total Claims	Extra Claims	Fee from below	Fee Paid
8	-20** =	X	
5	-3** =	2	80

Multiple Dependent ☐ = ☐

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
103 18	203 9	Claims in excess of 20
102 80	202 40	Independent claims in excess of 3
104 270	204 135	Multiple dependent claim, if not paid
109 80	209 40	** Reissue independent claims over original patent
110 18	210 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$) 80

\*\*for number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

3. ADDITIONAL FEES

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
105 130	205 65	Surcharge - late filing fee or oath	
127 50	227 25	Surcharge - late provisional filing fee or cover sheet	
139 130	139 130	Non-English specification	
147 2,520	147 2,520	For filing a request for <i>ex parte</i> reexamination	
112 920*	112 920*	Requesting publication of SIR prior to Examiner action	
113 1,840*	113 1,840*	Requesting publication of SIR after Examiner action	
115 110	215 55	Extension for reply within first month	
116 390	216 195	Extension for reply within second month	
117 890	217 445	Extension for reply within third month	
118 1,390	218 695	Extension for reply within fourth month	
128 1,890	228 945	Extension for reply within fifth month	
119 310	219 155	Notice of Appeal	
120 310	220 155	Filing a brief in support of an appeal	
121 270	221 135	Request for oral hearing	
138 1,510	138 1,510	Petition to institute a public use proceeding	
140 110	240 55	Petition to revive - unavoidable	
141 1,240	241 620	Petition to revive - unintentional	
142 1,240	242 620	Utility issue fee (or reissue)	
143 440	243 220	Design issue fee	
144 600	244 300	Plant issue fee	
122 130	122 130	Petitions to the Commissioner	
123 50	123 50	Processing fee under 37 CFR 1.17(q)	
126 180	126 180	Submission of Information Disclosure Stmt	
581 40	581 40	Recording each patent assignment per property (times number of properties)	
146 710	246 355	Filing a submission after final rejection (37 CFR § 1.129(a))	
149 710	249 355	For each additional invention to be examined (37 CFR § 1.129(b))	
179 710	279 355	Request for Continued Examination (RCE)	
169 900	169 900	Request for expedited examination of a design application	

Other fee (specify) \_\_\_\_\_

\*Reduced by Basic Filing Fee Paid SUBTOTAL (3) (\$)

## SUBMITTED BY

Name (Print/Type)	SCOTT MUIRHEAD	Registration No (Attorney/Agent)		Complete (if applicable)
Signature	<i>Scott Muirhead</i>	Telephone	724 437 0250	Date
				07/02/2001

**WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Dated: July 2, 2001

Hon. Commissioner of Patents and Trademarks  
Washington, D.C. 20231

RE: APPLICATION TRANSMITTAL LETTER

Sir:

Transmitted herewith for filing under 37 C.F.R § 1.53(b) is a patent application for  
TRIPLE SHEET THERMOFORMING APPARATUS.

Identified by: First named inventor S. MUIRHEAD

**1. Type of Application**

This application is a continuation-in-part of prior application No. 09/337,792, filed  
08/20/99.

A. Provisional Application Priority: I hereby claim the benefit under 35 U.S.C. § 119(e)  
of United States provisional application Serial No. 60/097,200, dated August 20, 1998.

B. U.S. Patent Application Priority: I hereby claim the benefit under 35 U.S.C. § 120 of  
the United States application Serial No. 09/377,792, dated August 20, 1999, the status of which  
is now pending in Art Unit Group 1732.

If for some reason your applicant has not requested a sufficient extension of time in  
the parent application, and/or has not paid a sufficient fee for any necessary response  
in the parent application and /or for the extension of time necessary to prevent  
abandonment of the parent application prior to the filing of this application, please  
consider this as a Request for an Extension for the required time period and/or please  
advise applicant of any fee that may be due. This Form is being filed in Duplicate: one  
copy for this application; and one copy for the above-mentioned parent application (if  
any extension of time is necessary).

**2. Contents of Application**

A. Specification of 34 pages

Please cancel original claims 2, 3, 4 and 5 of the prior application before calculating the filing fee. Original claims 1 and 6 are retained for filing date purposes.

- B. Informal Drawings on 15 sheet showing Figures 1-24 are enclosed.
- C. The enclosed Oath/Declaration is newly executed.
- D. Form PTO/SB/06, Patent Application Fee Determination Record is enclosed

The calculated fees will be paid within the time allotted for completion of the filing requirements.

3. **Other Submissions**

- A. A substitute specification in clean form is enclosed.  
A marked up specification is enclosed.  
A copy of the original specification, as filed 08/20/99, is enclosed.
- B. A copy of the original drawings, as filed 08/20/99, are enclosed.  
New drawings for present application are enclosed.
- C. A revocation and substitute power of attorney appointing your applicant with the powers to prosecute this C-I-P application is enclosed
- D. An Express Mailing Certificate is enclosed.
- E. A return receipt postcard in enclosed.

Attention is directed to the fact that the correspondence address for this application is

Scott Muirhead  
RR 3 Box 712X  
Uniontown, Pennsylvania, 15401  
(724) 437-0250

4. **Remarks**

In connection with the present new C-I-P application, please consider the following remarks set forth below.

According to an Office communication dated 07/28/00, your applicant was required to make an election/restriction on application serial number 09/377,792, now pending in Art Unit 1732 with examiner L. Tentoni.

In this connection an original copy of the parent application specification as filed 08/20/99, is enclosed herewith.

The enclosed continuation-in-part application specification sets forth only that portion of the earlier disclosure which is germane to the present invention, which is restricted to a third claim group, drawn to an apparatus for forming, classified in class 425, subclass 402

Your applicant submits a new specification and drawings for purposes of clarity. Further, your applicant believes the number and nature of amendments necessary to carve out the germane matter would be so extensive that the application papers as originally filed would be so difficult to consider or arrange for printing and copying, and therefore, on these further grounds, the examiner is hereby requested to approve the substitute specification and drawings.

A marked-up copy of the substitute specification showing the matter being added to and the matter being deleted from the specification of record is attached herein. A substitute specification in clean form is also submitted and the examiner's approval therefor is requested.

The substitute specification and drawings contained herein sets forth what your applicant believes to be the best mode of the invention, and that best mode, although embraced in the original claims, was not clear and concise in the original disclosure. Therefore the examiner may find that the addition of new matter is present in the body of the disclosure. The claims rely upon the matter disclosed in the original specification Your applicant has therefore enclosed a newly executed (supplemental) declaration herewith.

Notwithstanding the removal of matter not germane to the present invention of this new application, your applicant requests that the prior parent application designated 09/377,792 be hereby incorporated herein by such reference, and that matter carved out of the original specification would not be canceled with prejudice.

#### **IN THE SPECIFICATION**

For the sake of clarity, please amend the title of the invention from TRIPLE SHEET THERMOFORMING APPARATUS, METHODS AND ARTICLES to TRIPLE SHEET THERMOFORMING APPARATUS.

Below the title of the invention please add the paragraph heading CROSS-REFERENCE TO RELATED APPLICATIONS and new paragraph [0001.1]

Under the section entitled TECHNICAL FIELD, please delete paragraph [0001] and replace with new paragraph [0002.1].

Under the section entitled DESCRIPTION OF THE PRIOR ART, please delete paragraphs [0002] through [0010] and replace with new paragraphs [0003.1] through [0012.1].

Under the section entitled SUMMARY OF THE INVENTIONS, please amend the section heading to SUMMARY OF THE INVENTION, delete the sub-section headings, cancel the paragraphs [0011] through [0036] and replace with new paragraphs [0013.1] through [0024.1].

Under the section entitled DESCRIPTION OF THE DRAWINGS, please delete paragraphs [0037] through [0060] and replace with new paragraphs [0025.1] through [0048.1].

Under the section entitled DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT, please delete paragraphs [0061] through [0117] and replace with new paragraphs [0049.1] through [0094.1].

Please delete the Abstract Section of the specification and replace it with the following Abstract in clean form. Applicant includes herewith an Attachment for Specification Amendments showing a marked up version of the previous version of the Abstract Section.

#### ABSTRACT

A thermoforming machine for manufacturing triple sheet thermoplastic articles is disclosed. The thermoforming machine comprises three controllable ovens for heating three sheets to a heat deformable temperature, three shape giving molds for separately thermoforming each sheet in succession, and forging-like means to compress the three thermoformed sheets into a unitary article. The three sheets are thermoformed and compressed together in a form station comprising upper and lower platens. Acting with the upper platen is a mold shuttle system for moving two of three molds into position relative the thermoforming and forging-like operations of the apparatus.

#### IN THE CLAIMS

Please cancel Claims 2, 3, 4 and 5, without prejudice, and amend Claims 1 and 6 as follow:

1. (Amended) Apparatus for differential pressure forming a single article from three heat deformable thermoplastic sheets comprising:

four work stations designated one, two, three and four positioned in spaced relation in a circular arrangement,

a frame supporting said work stations,

said work stations one, two and three including an oven for heating the thermoplastic sheets to a thermoformable temperature,

said work station four including opposed platens movable vertically between open and closed positions,

an indexing wheel rotatably supported surrounding said work stations,

said indexing wheel including four clamp frames movable with said indexing wheel into spaced [vertical] relations with said four work stations respectively, and

drive means connected to said indexing wheel for rotating said indexing wheel to advance the three thermoplastic sheets secured to said clamp frames to said work stations one, two, and three for heating and to said work station four for molding each of the three heated thermoplastic sheets into a preselected configuration and fusing the molded sheets together in overlying relation to form a [single] unitary thermoplastic article.

6. (Amended) Apparatus for thermoform molding three thermoplastic sheets to form a triple sheet molded article comprising:

a work station,

three thermoforming molds designated one, two, and three [slidably] supported on said work station for molding three thermoplastic sheets respectively,

a slide assembly mounted on said work station for independently moving two molds in overlying relation into and out of a fixed position on said work station for molding the thermoplastic sheets,



a first platen and a second platen positioned in overlying spaced relation on said work station for independent movement between open and closed positions,

said first platen [slidably] receiving mold one for movement into compressed relation with sheet one,

said second platen slidably receiving molds two and three in succession for movement into compressed relation with sheets two and three in succession respectively,

said first platen with said mold one positioned thereon movable to a closed position into contact with sheet one to mold sheet one into a preselected configuration[s],

said second platen with said mold two positioned [thereon] thereon movable to a closed position into contact with sheet two to mold sheet two into a preselected configuration,

said first and second platen with molded sheets one and two thereon movable into compressed relations to force together molded sheets one and two to form a twin sheet molded [article] sub-assembly,

said first platen retaining the twin sheet molded [article] sub-assembly with said second platen slidably exchanging mold two with mold three,

[said second platen comprising mold three into contact with sheet three to mold sheet three into a selected configuration,] said second platen with said mold three positioned thereon movable to a closed position into contact with sheet three to mold sheet three into a preselected configuration, and

said first platen carrying the twin sheet molded [article] sub-assembly into compressed relation with said second platen carrying the molded sheet three to fuse molded sheet three to the twin sheet molded article to form a triple sheet molded article.

Please add new Claims 7-12

7. (New) A thermoforming machine comprising:
- a machine frame;
  - three ovens spaced upon the machine frame;
  - at least three clamp frames operable to convey three sheets in succession through the three ovens and a form station;
  - the form station has a lower platen and an upper platen;
  - the lower platen supports a first mold;
  - the upper platen is connected to a mold shuttle system, the mold shuttle system holds a second mold and a third mold and is operable to alternately deliver the second mold and the third mold into a supporting position upon the second platen;
  - the lower platen is operable to carry the first mold from an open position to a first closed position to thermoform a first sheet, repeatedly carry the thermoformed first sheet to the open position, compress the first mold against the second mold at a second closed position, and compress the first mold against the third mold at a third closed position; and
  - the upper platen is operable from an open position to interface with the mold shuttle system, to receive and carry the second mold to a first closed position to thermoform a second sheet, to receive and carry the third mold to a second closed position to thermoform a third sheet, and remain in the first and second closed positions when the lower platen compresses the first mold against the second mold in the first closed position and the third mold in the second closed position.

8. (New) The thermoforming machine of claim 7 further comprising:  
a bolster plate beneath the first mold;  
between the bolster plate and the lower platen a plurality of vertically acting actuators;  
and

a controller means causing the actuators to incrementally move the bolster plate vertically compressing the first mold against the second mold in the first closed position and the third mold in the second closed position.

9. (New) A Thermoforming apparatus having a triple sheet form station, the triple sheet form station comprising:

a frame;  
a lower platen supported for vertical movement upon the frame;  
a first mold mounted on the lower platen;  
an upper platen supported for vertical movement upon the frame above the lower platen;  
a mold shuttle system supported upon the frame acting with the upper platen;  
a second and third mold mounted for horizontal movement on the mold shuttle system;  
and

an controllable actuation means selectively moving the second or third mold horizontally on the mold shuttle system into an engaged position upon the upper platen for vertical movement thereon.

10. (New) The triple sheet form station of claim 9 further comprising:

a plurality of upper gear posts supported upon the frame extending vertically adjacent the upper platen;

engaging the upper gear posts upper platen gears precisely driven by at least one first motor for selective vertical movement of the upper platen;

a plurality of gear posts supported upon the frame extending vertically adjacent the lower platen below the upper gear posts;

engaging the lower gear posts lower platen gears precisely driven by at least one second motor for selective vertical movement of the lower platen below the upper platen; and

a controller means for selectively controlling the first and second motors for independent and simultaneous precise movement of the upper and lower platens upon the frame.

11. (New) Three sheets of thermoplastic are united between thermoform tooling to provide a triple sheet article, the thermoform tooling comprises:

a first mold for thermoforming a first sheet of thermoplastic characterized by a first intended article section providing a first exteriorly visible surface, a first outer adjacent section and a first margin section there between;

a second mold for thermoforming a second sheet of thermoplastic characterized by a second intended article section providing a interior structure that is not exteriorly visible, a second outer adjacent section and a second margin section there between;

a third mold for thermoforming a third sheet of thermoplastic characterized by a third intended article section providing a second exteriorly visible surface, a third outer adjacent section and a third margin section there between;

where in the first mold co-acts with the second mold to cross link the first margin section and the second margin section and where after the first mold co-acts with the third mold to cross link the second margin section and the third margin section to thereby unite the three sheets of thermoplastic into a triple sheet article.

12. (New) The thermoform tooling of claim 11 where:

the first, second and third margin sections cross link to characterize an over lapping seam; and

the first, second and third outer adjacent sections are removed from the first, second and third intended article sections at the over lapping seam to provide a unitary article of three united thermoplastic sheets.

#### **FINAL REMARKS**

The amendments and new claims contained herein were not made to circumvent any prior art or other reference, such that all of the claimed elements should be given a full range of equivalents when interpreted.

A substitute specification in clean form is enclosed herewith. An original parent application copy and a marked-up copy of the substitute specification is also enclosed.

In view of the disclosure made herein, it is submitted that the present application is in condition for examination. Your Applicant therefore wishes to thank the Examiner in advance for his or her efforts to pass the case.

Respectfully submitted,

By:  .

Scott Muirhead

Scott Muirhead  
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Uniontown, PA 15401  
(724) 437-0250